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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,037	09/27/2001	Richard C. Chu	POU920010085US1	2577

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EXAMINER

PATEL, NIHIR B

ART UNIT PAPER NUMBER

3743

DATE MAILED: 02/25/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,037

Applicant(s)

CHU ET AL.

Examiner

Nihir Patel

Art Unit

3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on August 25th, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 13-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date Sept. 27th, 2001.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group II (claims 1-12 and figures 4 and 5) in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 2 (figure 1) and 13-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Besanger Us Patent No. 5,208,733. Besanger discloses an enclosure and printed circuit card with heat sink that comprises a heat sink base structure 23 (see figure 1), the heat sink base structure having a coolant inlet 24 for receiving a coolant and a coolant outlet 22 for distributing a coolant, wherein the heat sink base structure defines at least one coolant channel disposed so as to be communicated with the coolant inlet and the coolant outlet; and a coolant distribution structure 21 (see figure 1), wherein the coolant distribution structure defines at least one distribution

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cavity (see column 3 lines 60-67) and includes at least one distribution inlet communicated with the distribution cavity and wherein the coolant distribution structure is disposed relative to the heat sink base structure such that the distribution inlet is communicated with the coolant outlet (see figure 1).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besanger US Patent No. 5,208,733 in view of Mankaruse et al. US Patent No. 6,411,512. Referring to claim 4, Besanger discloses the applicant's invention as claimed with the exception of providing a heat sink base that is constructed from copper.

Mankaruse discloses a high performance cold plate that does provide a heat sink base that is constructed from copper (see column 4 lines 60-65). Therefore it would be obvious to modify Besanger's invention by providing a heat sink base that is constructed from copper to improve the heat transfer process.

Referring to claim 11, Besanger discloses the applicant's invention as claimed with the exception of providing a heat transfer surface that is constructed from copper.

Mankaruse discloses a high performance cold plate that does provide a heat transfer surface that is constructed from copper (see column 4 lines 60-65). Therefore it would be

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obvious to modify Besanger's invention by providing a heat transfer surface that is constructed from copper to improve the heat transfer process.

Claims 3, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besanger US Patent No. 5,208,733 in view of DiGiacomo et al. US Patent No. 6,085,831.

Referring to claim 3, Besange discloses the applicant's invention as claimed with the exception of providing a coolant distribution structure that is constructed of a porous material.

DiGiacomo discloses a direct chip-cooling through liquid vaporization heat exchange that does provide a coolant distribution structure that is constructed of a porous material. Therefore it would be obvious to modify Besanger's invention by providing a coolant distribution structure that is constructed of a porous material in order to improve the heat transfer process.

Referring to claim 10, Besanger discloses the applicant's invention as claimed with the exception of providing a coolant distribution device that is constructed of a wicking material.

DiGiacomo discloses a direct chip-cooling through liquid vaporization heat exchange that does provide a coolant distribution device that is constructed of a wicking material. Therefore it would be obvious to modify Besanger's invention by providing a coolant distribution device that is constructed of a wicking material in order to improve the heat transfer process.

Referring to claim 10, Besanger discloses the applicant's invention as claimed with the exception of providing heat transfer surface that is constructed of porous material.

DiGiacomo discloses a direct chip-cooling through liquid vaporization heat exchange that does provide heat transfer surface that is constructed of porous material. Therefore it would be obvious to modify Besanger's invention by providing heat transfer surface that is constructed of porous material in order to improve the heat transfer process.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Besanger US Patent No. 5,208,733 in view of Salt Us Patent No. 5,603,375. Resanger discloses the applicant's invention as claimed with the exception of providing coolant distribution device that is a cotton string.

Salt discloses a heat transfer device that does provide coolant distribution device that is a cotton string. Therefore it would be obvious to modify Besanger's invention by coolant distribution device that is a cotton string in order to improve the heat transfer process.

Referring to claim 12, the applicant claims that the module attachment structure is constructed from copper. Since copper and aluminum are well known for their excellent heat transfer capabilities and since the applicant has provided no criticality of using copper to construct the module attachment structure, it is obvious design choice to use either copper as stated in the application or to us aluminum as stated in Mankaruse et al. US Patent No. 6,411,512 to construct the module attachment structure.

Allowable Subject Matter

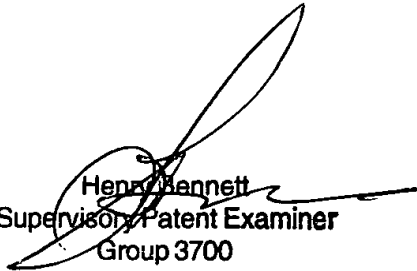
4. Claims 5, 6, and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. If claims 5, 6, and 7 are combined with claim 1, the application could be considered for allowance upon a further search by the examiner.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Nihir Patel whose telephone number is (703) 306-3463. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful the examiner supervisor Henry Bennett can be reached at (703) 308-0101.

NP
February 13th, 2004


Henry Bennett
Supervisory Patent Examiner
Group 3700